



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/482,354	01/14/2000	Hidehiro Iizuke	381NP/48511	6862

7590 01/23/2003  
CROWELL & MORING LLP  
Intellectual Property Group  
P.O. Box 14300  
Washington, DC 20044-4300

EXAMINER

VANOY, TIMOTHY C

ART UNIT	PAPER NUMBER
----------	--------------

1754

DATE MAILED: 01/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09-482,354

Applicant(s)

IIZUKA et al.

Examiner

VANOV

Group Art Unit

1754

— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address —

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE THREE MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

THE "RESPONSE TO RESTRICTION REQUIREMENT" DATE DEC. 31, 02.

☒ Responsive to communication(s) filed on

☐ This action is FINAL.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

☒ Claim(s) 1-18 is/are pending in the application.

Of the above claim(s) 7-18 is/are withdrawn from consideration.

☐ Claim(s) is/are allowed.

☒ Claim(s) 1-6 is/are rejected.

☒ Claim(s) 1-3 AND 5 is/are objected to.

☒ Claim(s) 1-18 are subject to restriction or election requirement

## Application Papers

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☒ The drawing(s) filed on JAN. 14, 2000 is/are objected to by the Examiner

☒ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119 (a)-(d)

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

☒ All ☐ Some\* ☐ None of the:

☒ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.

☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

\*Certified copies not received: \_\_\_\_\_

## Attachment(s)

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 3

☐ Interview Summary, PTO-413

☒ Notice of Reference(s) Cited, PTO-892

☐ Notice of Informal Patent Application, PTO-152

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Other \_\_\_\_\_

Office Action Summary

## DETAILED ACTION

### *Election/Restrictions*

Applicant's election without traverse of claims 1-6 in the Response to Restriction Requirement dated Dec. 31, 2002 (paper no. 6) is acknowledged.

### *Priority*

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### *Drawings*

81a) Fig. 2 is objected to as failing to comply with 37 CFR 1.84(p)(5) because it includes the reference sign "29", which is not mentioned in the description of figure 2 set forth in the specification. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action **to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.**

81b) Figs. 1 and 2 are objected to under 37 CFR 1.83(a). Figs. 1 and 2 must show every feature of the invention specified in the claims. Therefore, the flow of helium gas through the catalyst alluded to in claims 1 and 5 must be shown in either (or both) Figs. 1 and 2 or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action **to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.**

- c) The drawings filed on Jan 14, 2000 have been approved by the PTO Draftsperson.

### ***Specification***

- OK a) Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to **a single paragraph** on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

- OK b) In the abstract, it would be helpful if specific (or preferred) examples of the catalyst components were recited to present a clearer picture of the invention.
- OK c) The title of the invention is objected to because it is too long.
- OK d) On the last line on pg. 31, part of the text is typed over.
- OK e) The sentence set forth on pg. 9 lns. 9-13 appears to be in error because it refers to NO<sub>x</sub> as a component of the composite oxide.

### ***Claim Objections***

- OK a) In claims 1-3 and 5, "type" should be replaced with "component".

OK b) In claim 5 ln. 21, "and" is mistyped.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

OK a) None of the claims particularly point out and distinctly set forth what the components are that are described as "at least one type selected from (specific metal)". Describing what the metal is in the component does not particularly point out and distinctly set forth what the component is. If the component is metallic or elemental (zero oxidation state), then the claim language should point this out. If the component is in the form of an oxide, then the claim language should be so limited. If there are other metals present in the component, in addition to the specific metal recited, then the claim language should point this out (for example, in the case of spinels and perovskites). If the component is in the form of salts, then the claim language should point out what those salts are.

OK b) Claim 1 is confusing because the claim language seems to suggest that the steps of removing CO from the exhaust gas and passing helium through the exhaust gas are also required, but there is only a single method step recited in the claim language: namely, passing the exhaust gas through the catalyst to remove NOx from

Art Unit: 1754

the exhaust gas, wherein the exhaust gas is passed through the catalyst under alternate fuel rich and fuel lean conditions. If the method requires removing CO out of the exhaust gas, and passing helium through the catalyst, then the claim language must particularly point this out and distinctly recite these two method steps as definite limitations. Reciting that the catalyst has a certain CO adsorbent enthalpy does require that any CO be removed from the exhaust gas in a distinct method step. Reciting "... in the event of temperature rise in He gas flow ..." does not require that any helium gas was passed through the catalyst. Claim 5 is also confusing for this same reason.

of c) Claim 3 does not particularly point out and distinctly set forth if the "type" that may include Ti, Si and Zr and the "composite oxide" that may include Ti, Si and Zr are the same component or are two distinct components.

of d) It is not clear how claim 6 further limits claim 5 in as much as claim 5 already sets forth that the catalyst may contain alkaline earth metal. The language of claims 5 and 6 raises the question: does the catalyst contain from 5 to 30 parts by weight of alkaline earth metal (as set forth in claim 5) or does the catalyst contain from 5 to 50 parts by weight of alkaline earth metal (as set forth in claim 6)?

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

The person having "ordinary skill in the art" has the capability of understanding the scientific and engineering principles applicable to the claimed invention. The references of record in this application reasonably reflect this level of skill.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 97/47864.

"Test Manner 1" and Table 7 set forth on pg. 59 et seq. and claim 1 in WO 97/47864 describes at least an obvious variation of the same method for purifying the exhaust gas emitted from an internal combustion: comprising:

passing the exhaust gas, contaminated with NO<sub>x</sub> and CO, through a catalyst under stoichiometric air/fuel conditions so that NO<sub>x</sub> is sorbed into the catalyst and then passing the exhaust gas through the catalyst under fuel rich-air lean conditions so that the sorbed NO<sub>x</sub> is reduced by the reducing agent.

The difference between the Applicants' claims and WO 97/47864 is that the Applicants' claims call for passing the exhaust gas through the catalyst under fuel lean-air rich conditions (whereas "Test Manner 1" in WO 97/47864 sets forth that the exhaust gas was passed through the catalyst under stoichiometric conditions).

The paragraph bridging pgs. 35 and 36 in WO 97/47864 fairly suggests that such fuel lean-air rich conditions were contemplated as a viable and obvious alternative to operation under stoichiometric air/fuel conditions.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process described in WO 97/47864 by substituting the fuel lean-air rich conditions mentioned in the paragraph bridging pgs. 35 and 36 in WO 97/47864 in lieu of the stoichiometric air/fuel conditions mentioned in "Test Manner 1" set forth on pg. 59 et seq. in WO 97/47864, in the manner required by the Applicants' claims, because the paragraph bridging pgs. 35 and 36 in WO 97/47864 fairly suggests that this substitution was contemplated by the Authors of WO 97/47864.

The catalysts set forth on Table 7 on pg. 59 in WO 97/47864 contain:

- cerium in amounts ranging from 5 to 40 weight percent;
- strontium in amounts ranging from 3 to 40 weight percent;
- titanium in amounts ranging from 0.1 to 30 weight percent;



Art Unit: 1754

- platinum in amounts ranging from 0.2 to 4 weight percent;
- rhodium in amounts ranging from 0.15 to 1 weight percent, and
- magnesium (1 weight percent).

The difference between the Applicants' claims and the catalysts of Table 7 on pg. 59 in WO 97/47864 is that the Applicants' claim 1 calls for the presence of a CO-sorbent component (which claim 2 identifies as palladium). Additionally, Applicants' claim 5 sets forth that the catalyst may also contain palladium.

Claim 9 in WO 97/47864 sets forth that the catalyst also contains at least one of platinum, palladium and rhodium.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the catalyst and process described in "Test Manner 1" and Table 7 on pg. 59 et seq. in WO 97/47864 by including the palladium of claim 9 in WO 97/47864, in the manner required by Applicants' claims 1, 2 and 5, because the Authors of WO 97/47864 contemplated this embodiment by the scope of their language in their claim 9 "*at least one of. . .*", consistent with the discussion of the *In re Petering* 301, F.2d 676, 681, 133 USPQ 275, 280 (CCPA 1962) court decision set forth in section 2144.08(II)(A)(4)(a) in the MPEP (8<sup>th</sup> ed.) where it was established that the selection of a specie out of a genus of 20 species disclosed in a prior art reference was anticipated by that prior art reference.

Further, note that claim 7 in WO 97/47864 sets forth that the catalyst may also contain at least one of titanium and silicon, as set forth in at least Applicants' claims 3 and 5. Also, note that the description of the catalysts set forth on pg. 19 lns. 3-8 and pg.

Art Unit: 1754

26 et seq. in WO 97/47864 seems to suggest that the titanium and silicon are also forming complex oxides with the sodium, magnesium, etc. as set forth in Applicants' claim 3.

Also, note that the description of the catalysts set forth on pg. 26 et seq. in WO 97/47864 also seems to suggest that the catalyst contains a separate layer or component of magnesium, which is distinct and apart from the magnesium in another layer or component in the catalyst, in a manner fairly suggesting the limitations of Applicants' claim 6.

The difference between the Applicants' claims and WO 97/47864 is that Applicants' claims 1 and 5 describe the physical characteristics of the CO adsorbent component as having a defined enthalpy on the surface of a metal crystal and certain adsorption and desorption characteristics defined as a function of helium gas flow rate and temperature.

Applicants' claim 2 sets forth that the CO adsorbent may be same palladium set forth in claim 9 in WO 97/47864.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to further described the physical and chemical properties of the palladium set forth in claim 9 in WO 97/47864, in the manner set forth in the scope of Applicants' claims 1 and 5, because the courts have already determined that such description of latent properties inherently present in the prior art (in this case, the palladium set forth in claim 9 in WO 97/47864) is *prima facie* obvious: please see the

Art Unit: 1754

discussion of the *In re Wiseman* 596 F.2d 1019, 201 USPQ 658 (CCPA 1979) court decision set forth in section 2145(II) in the MPEP (8<sup>th</sup> ed.).

The following references, which are indicative of the state of the art, are made of record:

U. S. Pat. Pub No. 2002/0182134 A1 and U. S. Pat. Pub. No. 2002/0141921 A1 disclosing SOx tolerant NOx traps;

U. S. Pat. 6,471,923 B1 disclosing a process for absorbing NOx;

U. S. Pat. 6,461,579 B1 disclosing a catalyst for purifying exhaust gas;

U. S. Pat. 6,455,463 B1 disclosing alkaline earth/transition metal lean NOx catalysts;

U. S. Pat. 6,413,483 B1 disclosing a catalytic converter for a lean burn engine;

U. S. Pat. 5,948,376 disclosing exhaust catalysts, and

U. S. Pat. 5,849,255 disclosing a method for treating diesel exhaust gas.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy C. Vanoy whose telephone number is 703-308-2540. The examiner can normally be reached on 8 hr. days.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman, can be reached on 703-308-3837. The fax phone numbers for the organization where this application or proceeding is assigned are 703-

Art Unit: 1754

872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Timothy Vanoy/tv  
January 21, 2003

  
Timothy Vanoy  
Patent Examiner

Art Unit 1754